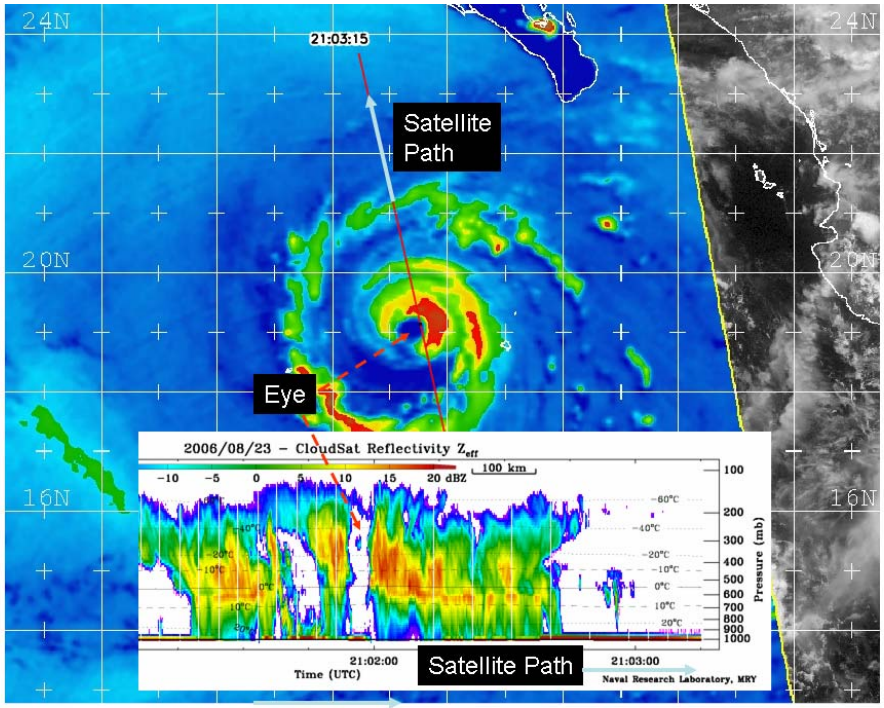
Headliner!

CLOUDSAT PEERS INTO THE OCEAN'S MOST POWERFUL STORMS

October 20 2006

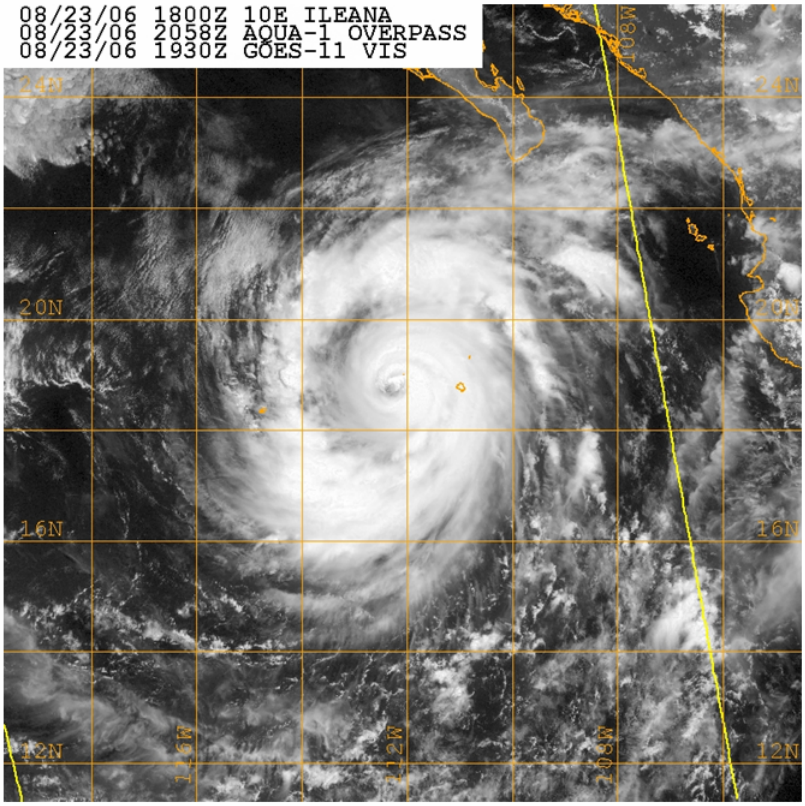
The *Naval Research Laboratory's* NexSat site, now displays near-realtime products using NASA's new spaceborne cloud radar, CloudSat. Launched on April 28, 2006 (data started on June 2, 2006), CloudSat shows the detailed structure of a variety of clouds in the troposphere, including detailed information about tropical cyclones (BAMS reference for AMS subscribers).



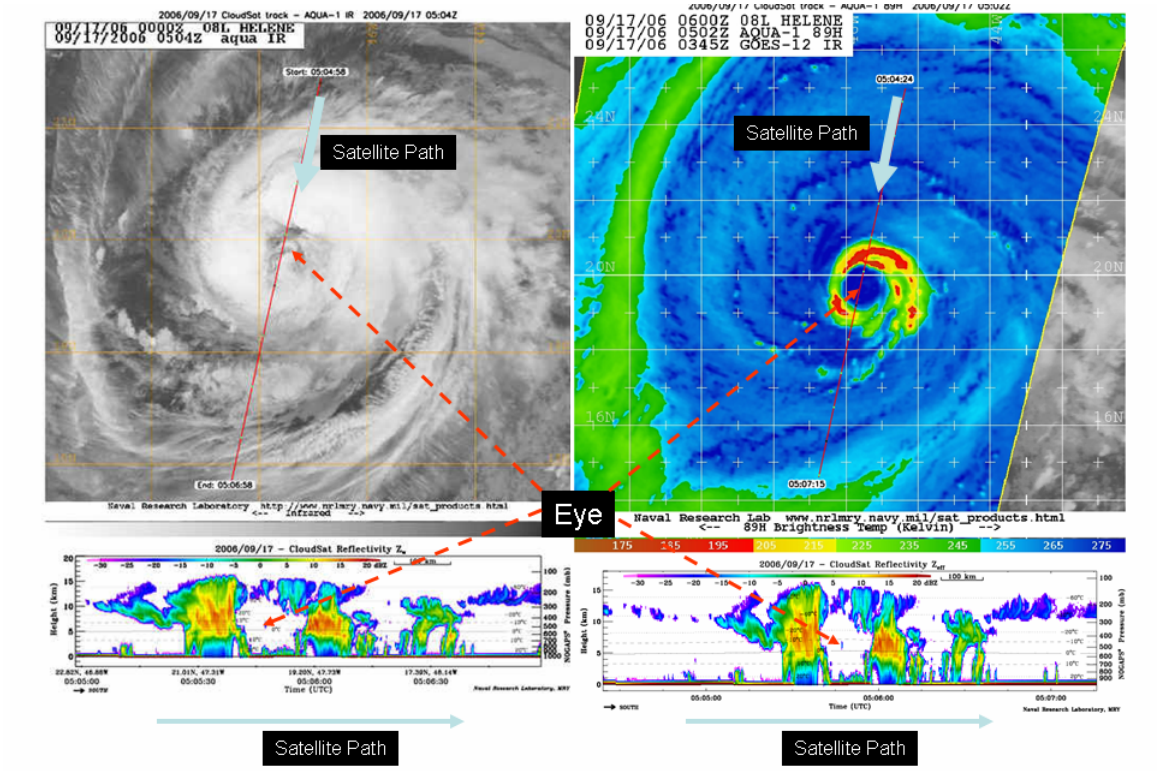
CloudSat Profile through Hurricane Ileana in the Eastern Pacific. Background: AMSR-E 89 GHz image; Insert: CloudSat reflectivity cross-section. August 23 2006, 2058 UTC.

CloudSat is not the only instrument flying in a satellite cluster called the "A Train" (Aqua, CloudSat, CALIPSO, PARASOL, and Aura). Aqua contains the Advanced Microwave Scanning Radiometer (AMSR-E) which shows precipitation from Hurricane Ileana (above, yellows and reds indicate the heaviest precipitation). We've superimposed the CloudSat track in red on the AMSR-E image to show the location of the CloudSat cross-section (bottom of the image). The cross-section shows Ileana's eye as a white vertical column embedded in a field of intense reflectivity (reds). Superimposed on the cross-section are temperature levels from the Navy Operational Global Atmospheric Prediction System (NOGAPS) model. As expected the radar melting layer (enhanced red band) appears below the 0 C level, although the correspondence is not consistent across the trace.

Notice that near the top of the eye on the CloudSat traces clouds appear in purple. These are cirrus clouds which prevent viewing into the eye using most images from geostationary visible and infrared satellites (corresponding visible image below). Often, these images make it appear that there is no eye, but in reality the eye is hidden below. Microwave imagery and especially CloudSat data reveal the structure of the eye in detail. Imagery such as the ASMR-E image has become a popular forecasting tool in the last few years to estimate the intensity, position and structure of tropical cyclones at sea. NRL puts visible/infrared, microwave, and now CloudSat products online in near-realtime (URL's below).



GOES Visible Image at about the same time as AMSR-E image above. August 23 2006, 1930 UTC.



Left: Aqua infrared image (above) and CloudSat trace (below). Right: AMSR-E image (above) and CloudSat trace (below). September 17 2006, 0504 UTC.

Above the infrared image (left) shows a partially cirrus-covered eye from Hurricane Helene. CloudSat which traveled overhead at about the same time shows a large eye partially hidden beneath the cirrus. The right side shows the corresponding AMSR-E image with less cirrus obscuration.

To see these products on the NexSat website, select the CloudSat button on the menu frame on the left on: http://www.nrlmry.navy.mil/NEXSAT.html

For the NRL Tropical Cyclones website go to:
http://www.nrlmry.navy.mil/tc_pages/tc_home.html

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